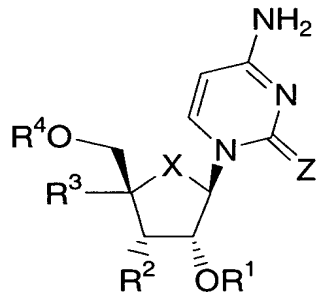
WHAT IS CLAIMED IS:

1. A compound of the structural formula I



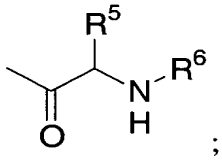
(I)

or a pharmaceutically acceptable salt thereof; wherein

X is O or S;

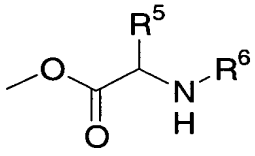
Z is O or S;

R^1 is hydrogen, methyl, C_{1-16} alkylcarbonyl, C_{2-18} alkenylcarbonyl, C_{1-10} alkyloxycarbonyl, C_{3-6} cycloalkylcarbonyl, C_{3-6} cycloalkyloxycarbonyl, $CH_2O(C=O)C_{1-4}$ alkyl, $CH(C_{1-4}$ alkyl$)O(C=O)C_{1-4}$ alkyl, or an amino acyl residue of structural formula



;

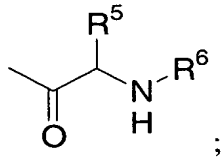
R^2 is hydrogen, hydroxy, fluoro, amino, methyl, methoxy, C_{1-16} alkylcarbonyloxy, C_{2-18} alkenylcarbonyloxy, C_{1-10} alkyloxycarbonyloxy, C_{3-6} cycloalkylcarbonyloxy, C_{3-6} cycloalkyloxycarbonyloxy, $-OCH_2O(C=O)C_{1-4}$ alkyl, $-OCH(C_{1-4}$ alkyl$)O(C=O)C_{1-4}$ alkyl, or an amino acyloxy residue of structural formula



;

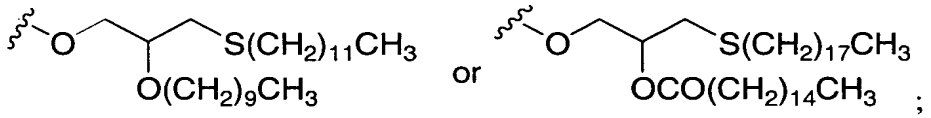
R^3 is selected from the group consisting of methyl, ethynyl, cyano, aminocarbonyl, fluoromethyl, bromomethyl, trifluoromethyl, aminomethyl, fluoro, chloro, and bromo;

R^4 is hydrogen, C_{1-10} alkylcarbonyl, C_{2-18} alkenylcarbonyl, C_{1-10} alkyloxycarbonyl, C_{3-6} cycloalkylcarbonyl, C_{3-6} cycloalkyloxycarbonyl, $CH_2O(C=O)C_{1-4}$ alkyl, $CH(C_{1-4}$ alkyl$)O(C=O)C_{1-4}$ alkyl, $P_3O_9H_4$, $P_2O_6H_3$, $P(O)R^7R^8$, or an amino acyl residue of structural formula



;

R^5 is hydrogen, C_{1-4} alkyl, or phenyl C_{0-2} alkyl;
R^6 is hydrogen, C_{1-4} alkyl, C_{1-4} acyl, benzoyl, C_{1-4} alkyloxycarbonyl, phenyl C_{0-2} alkyloxycarbonyl, C_{1-4} alkylaminocarbonyl, phenyl C_{0-2} alkylaminocarbonyl, C_{1-4} alkylsulfonyl, or phenyl C_{0-2} alkylsulfonyl; and
R^7 and R^8 are each independently hydroxy, $OCH_2CH_2SC(=O)C_{1-4}$ alkyl, $OCH_2O(C=O)OC_{1-4}$ alkyl, $NHCHMeCO_2Me$, $OCH(C_{1-4}$ alkyl$)O(C=O)C_{1-4}$ alkyl,

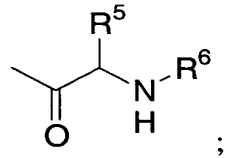


;

with the proviso that when X and Z are O, R^1 and R^4 are hydrogen, and R^2 is hydroxy, then R^3 is not methyl, fluoromethyl, ethynyl, or cyano.

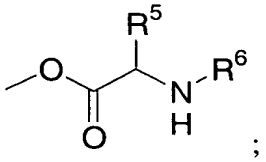
2. The compound of Claim 1 wherein X and Z are O.

3. The compound of Claim 1 wherein
R^1 is hydrogen, C_{1-16} alkylcarbonyl, or an aminoacyl residue of structural formula



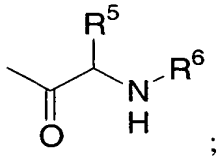
;

R^2 is hydroxy, C_{1-16} alkylcarbonyloxy, or an amino acyloxy residue of structural formula



;

R^3 is methyl or fluoromethyl; and
R^4 is hydrogen, C_{1-10} alkylcarbonyl, $P_3O_9H_4$, or an amino acyl residue of structural formula



;

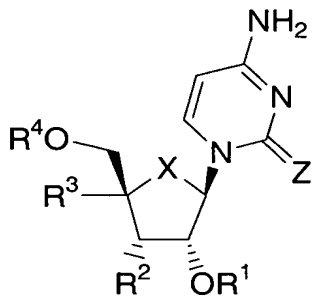
with the proviso that when X and Z are O, R^1 and R^4 are hydrogen, and R^2 is hydroxy, then R^3 is not methyl, fluoromethyl, ethynyl, or cyano.

4. A pharmaceutical composition comprising a compound of Claim 1 and a pharmaceutically acceptable carrier.

5. The pharmaceutical composition of Claim 4 useful for inhibiting RNA-dependent RNA viral polymerase, inhibiting RNA-dependent RNA replication, and/or treating RNA-dependent RNA viral infection.

6. The pharmaceutical composition of Claim 5 wherein said RNA-dependent RNA viral polymerase is HCV NS5B polymerase, said RNA-dependent RNA viral replication is HCV replication, and said RNA-dependent RNA viral infection is HCV infection.

7. A method of treating RNA-dependent RNA viral infection comprising administering to a mammal in need of such treatment a therapeutically effective amount of a compound of structural formula I:



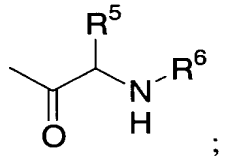
(I)

or a pharmaceutically acceptable salt thereof; wherein

X is O or S;

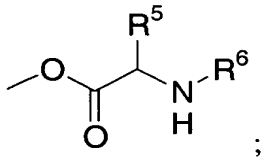
Z is O or S;

R^1 is hydrogen, methyl, C_{1-16} alkylcarbonyl, C_{2-18} alkenylcarbonyl, C_{1-10} alkyloxycarbonyl, C_{3-6} cycloalkylcarbonyl, C_{3-6} cycloalkyloxycarbonyl, $CH_2O(C=O)C_{1-4}$ alkyl, $CH(C_{1-4}$ alkyl$)O(C=O)C_{1-4}$ alkyl, or an amino acyl residue of structural formula



;

R^2 is hydrogen, hydroxy, fluoro, amino, methyl, methoxy, C_{2-18} alkenylcarbonyloxy, C_{2-18} alkenylcarbonyloxy, C_{1-10} alkyloxycarbonyloxy, C_{3-6} cycloalkylcarbonyloxy, C_{3-6} cycloalkyloxycarbonyloxy, $-OCH_2O(C=O)C_{1-4}$ alkyl, $-OCH(C_{1-4}$ alkyl$)O(C=O)C_{1-4}$ alkyl, or an amino acyloxy residue of structural formula



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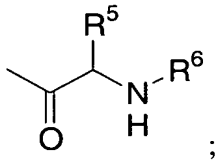
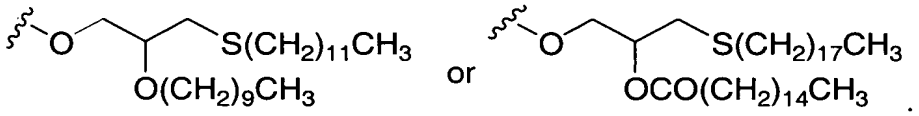
R^3 is selected from the group consisting of methyl, ethynyl, cyano, aminocarbonyl, fluoromethyl, bromomethyl, trifluoromethyl, aminomethyl, fluoro, chloro, and bromo;

R^4 is hydrogen, C_{1-10} alkylcarbonyl, C_{2-18} alkenylcarbonyl, C_{1-10} alkyloxycarbonyl, C_{3-6} cycloalkylcarbonyl, C_{3-6} cycloalkyloxycarbonyl, $CH_2O(C=O)C_{1-4}$ alkyl, $CH(C_{1-4}$ alkyl$)O(C=O)C_{1-4}$ alkyl, $P_3O_9H_4$, $P_2O_6H_3$, $P(O)R^7R^8$, or an amino acyl residue of structural formula



;

R^5 is hydrogen, C_{1-4} alkyl, or phenyl C_{0-2} alkyl;
R^6 is hydrogen, C_{1-4} alkyl, C_{1-4} acyl, benzoyl, C_{1-4} alkyloxycarbonyl, phenyl C_{0-2} alkyloxycarbonyl, C_{1-4} alkylaminocarbonyl, phenyl C_{0-2} alkylaminocarbonyl, C_{1-4} alkylsulfonyl, or phenyl C_{0-2} alkylsulfonyl; and
R^7 and R^8 are each independently hydroxy, $OCH_2CH_2SC(=O)C_{1-4}$ alkyl, $OCH_2O(C=O)OC_{1-4}$ alkyl, $NHCHMeCO_2Me$, $OCH(C_{1-4}$ alkyl$)O(C=O)C_{1-4}$ alkyl,



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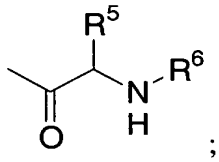
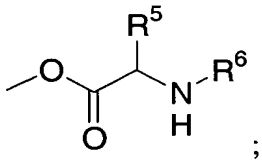
8. The method of Claim 7 wherein X and Z are O.

9. The method of Claim 8 wherein
R^1 is hydrogen, C_{1-16} alkylcarbonyl, or an aminoacyl residue of structural formula



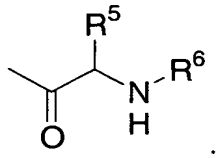
;

R^2 is hydroxy, C_{1-16} alkylcarbonyloxy, or an amino acyloxy residue of structural formula



;

R^3 is methyl or fluoromethyl; and
R^4 is hydrogen, C_{1-10} alkylcarbonyl, $P_3O_9H_4$, or an amino acyl residue of structural formula



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10. The method of Claim 9 wherein the compound of formula I is 4'-*C*-methylcytidine or 4'-*C*-(fluoromethyl)cytidine;
or a pharmaceutically acceptable salt thereof.

11. The method of Claim 7 wherein said RNA-dependent RNA viral infection is HCV infection.

12. The method of Claim 11 in combination with a therapeutically effective amount of another agent active against HCV.

13. The method of Claim 12 wherein said agent active against HCV is ribavirin; levovirin; thymosin alpha-1; interferon-β; an inhibitor of NS3 serine protease; an inhibitor of inosine monophosphate dehydrogenase; interferon-α or pegylated interferon-α, alone or in combination with ribavirin or levovirin.

14. The method of Claim 13 wherein said agent active against HCV is interferon-α or pegylated interferon-α, alone or in combination with ribavirin.

15. A method of treating HCV infection in a mammal in need thereof comprising administering to such mammal a therapeutically effective amount of 4'-*C*-methylcytidine or a pharmaceutically acceptable salt thereof.